Abstract

A switching regulator having a control circuit that automatically senses when a low power mode should be initiated without the use of expensive external components nor an extensive amount of external components is disclosed herein. The switching regulator includes an input switching device, a driver, an inductor, a first output switching device, a second output switching device and an output node. The control circuit includes a low power switching device connected to the output node and the second end of the inductor. An amplifier connects the low power switching device and the first output switching device. A first current mirror couples to the amplifier to mirror the difference between the output current through the output load and the current supplied at the second end of the inductor. A second current mirror couples to the first current mirror to mirror the current difference through a current source and a capacitor connected in parallel across the current source. A comparator compares the voltage generated by the capacitor with a predetermined voltage source. A first and second AND gate couples to the comparator. The output of the first AND gate provides a entry signal that initiates the low power mode for the switching regulator. The second AND gate couples to receive this entry signal. The output of the first AND gate provides a exit signal that indicates when the switching regulator is not in low power mode. The first AND gate couples to receive this exit signal.